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Variability in Access to Hospital Palliative Care in the United States

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Abstract

Background: Hospital palliative care programs provide high-quality, comprehensive care for seriously ill patients and their families.
Objective: To examine geographic variation in patient and medical trainee access to hospital palliative care and to examine predictors of these programs.
Methods: Primary and secondary analyses of national survey and census data. Hospital data including hospital palliative care programs were obtained from the American Hospital Association (AHA) Annual Survey Database™ for fiscal year 2006 supplemented by mailed surveys. Medical school-affiliated hospitals were obtained from the American Association of Medical Colleges, Web-site review, and telephone survey. Health care utilization data were obtained from the *Dartmouth Atlas of Health Care 2008*. Multivariate logistic regression was used to identify characteristics significantly associated with the presence of hospital palliative care.
Results: A total of 52.8% of hospitals with 50 or more total facility beds reported hospital palliative care with considerable variation by state; 40.9% (144/352) of public hospitals, 20.3% (84/413) of for-profit hospitals, and 28.8% (160/554) of Medicare sole community providers reported hospital palliative care. A total of 84.5% of medical schools were associated with at least one hospital palliative care program. Factors significantly associated ($p < 0.05$) with hospital palliative care included geographic location, owning a hospice program, having an American College of Surgery approved cancer program, percent of persons in the county with a university education, and medical school affiliation. For-profit and public hospitals were significantly less likely to have hospital palliative care when compared with nonprofit institutions. States with higher hospital palliative care penetration rates were observed to have fewer Medicare hospital deaths, fewer intensive care unit/cardiac care unit (ICU/CCU) days and admissions during the last 6 months of life, fewer ICU/CCU admission during terminal hospitalizations, and lower overall Medicare spending/enrollee.
Discussion: This study represents the most recent estimate to date of the prevalence of hospital palliative care in the United States. There is wide geographic variation in access to palliative care services although factors predicting hospital palliative care have not changed since 2005. Overall, medical students have high rates of access to hospital palliative care although complete penetration into academic settings has not occurred. The association between hospital palliative care penetration and lower Medicare costs is intriguing and deserving of further study.

Introduction

Palliative care provides high quality care for seriously ill patients and their families while making efficient use of hospital resources.[1] For patients to benefit from these services, however, hospital palliative care programs must be available locally within communities across the United States. In this report we examine the extent to which patients have access to hospital palliative care at the state level. Additionally, we examine the extent to which medical students have access to hospital palliative care programs during their clinical training. This report expands upon our prior publications in which we examined the hospital structural and demographic characteristics associated with the growth of hospital-based palliative care.[2,3]

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Methods

Data sources

Data were obtained from four primary sources: the American Hospital Association (AHA) Annual Survey Database™ for Fiscal Year 2006 (hospital characteristics including the presence of a palliative care program), the Association of American Medical Colleges (AAMC) (affiliated teaching hospitals for the nation's 126 public and private medical schools), the 2006 United States census (information about the hospital's community), and the *Dartmouth Atlas of Health Care 2008* (hospital admissions and deaths, ICU days and admissions, and Medicare costs by state). Supplemental data were provided through a mailed/faxed survey, telephone interviews of select medical school admission offices, and reviews of medical school websites as described below.

Hospital data. Data on hospital characteristics were obtained from the AHA Annual Survey Database™ for Fiscal Year 2006. The AHA surveys all member and nonmember hospitals in the United States and its associated areas on an annual basis. Among the over 850 elements included in the survey, data are provided on the type of authority responsible for establishing policy concerning overall operation of the hospitals (federal government, nonfederal government, nongovernment not-for-profit, and for-profit,); clinical facilities and services offered by the hospitals (e.g., general medical-surgical care, pediatric care, various types of intensive care units, physical rehabilitation, psychiatric services, cardiac programs, acquired immune deficiency disease [AIDS] care, etc.); beds and utilization; revenues and expenses; and professional staffing levels. For facilities and services, the survey also requests information on the manner in which a service is provided (i.e., whether it is hospital owned, provided by the hospital's health system, network, and/or provided through a formal contract between the hospital and another provider).

The survey also queried hospitals as to the presence of a palliative care program. The survey defines a palliative care program as, "an organized program providing specialized medical care, drugs or therapies for the management of acute or chronic pain and/or the control of symptoms administered by specially trained physicians and other clinicians; and supportive care services, such as counseling on advanced directives, spiritual care, and social services, to patients with advanced disease and their families." For this study, all hospitals reporting a program, regardless of whether it was being provided by the hospital, health system, or network, or provided through a contractual arrangement or joint venture with another provider (e.g., a hospice providing nonhospice palliative care to hospital patients), were coded as having an active program. The response rate for the AHA Annual Survey™ for Fiscal Year 2006 was 77%.

After publication of our last report,[3] several hospitals contacted the authors to state that the AHA had mistakenly classified them as not having hospital palliative care when indeed a program did exist at their institution (R.S. Morrison, personal communication, September 1, 2007). In order to allow hospitals to correct the data within the AHA survey we sent a short questionnaire in January of 2007 to each hospital in the AHA Annual Survey Database™ for Fiscal Year 2005 that reported at least one general medical/surgical bed. The questionnaire asked about the presence of hospital palliative care and requested details about the program if one did exist. Hospitals were also able to provide data through an online "Directory of Hospitals" via the website ⟨www.getpalliativecare.org⟩. Overall, 22% of the surveyed hospitals responded via mailed survey or online form. Of responding hospitals, 31% confirmed the presence of a palliative care program, 46% confirmed the absence of a program, 3% changed their status from no program to an active program, 17% changed their status from an active program to no program, and 3% reported on data missing from the AHA survey. For hospitals that did not respond to the questionnaire, the original data provided by the AHA were used.

Medical school data. Data concerning hospital affiliation with United States allopathic medical schools were abstracted from the AAMC database of U.S. medical schools. The database records the primary teaching hospital affiliates for U.S. medical schools. After excluding those medical schools in Puerto Rico and associated with the armed forces, affiliate data were available for 100 of 121 medical schools. We reviewed websites and contacted the schools' Office of Academic Affairs by telephone to obtain data on the missing 21 schools. If the school did not report any official affiliate institutions, the primary teaching sites for the third- and fourth-year clerkship rotations were used. The AAMC also provided data concerning public and private status of the U.S. medical schools.

A medical school was considered to be affiliated with a hospital palliative care program if one or more of its main teaching hospitals reported the presence of a palliative care program. Medical school data were merged with the AHA data by hospital name and location.

Census data. Census data were obtained electronically from the United States Census Bureau website, ⟨http://factfinder.census.gov⟩, and reflect data current for 2006.[4] Census data were merged with primary survey data via census bureau county code. Census data used in this study included: level of education, ethnic makeup, age distribution, and the distribution of wealth.

Health care utilization data. State rankings of Medicare deaths in hospital, intensive care unit /coronary care unit (ICU/CCU) admissions during terminal hospitalizations, ICU/CCU admissions per 1000 decedents in the last 6 months of life, ICU/CCU days per decedent in the last 6 months of life, Medicare reimbursement/enrollee, and the number of Medicare hospital admissions in the last 6 months of life were obtained from the *Dartmouth Atlas of Health Care 2008* at ⟨www.dartmouthatlas.org/data_tools.shtm⟩.[5]

Hospital inclusion and exclusion criteria

Hospitals were included in this study if they admitted adult patients and the majority of admissions were identified as general medical–surgical, obstetrics/gynecology, cancer, or cardiac. We excluded rehabilitation hospitals, psychiatric hospitals, subacute and chronic care facilities, and eye, ear, nose, and throat hospitals. General medical surgical and chronic disease hospitals that restricted admissions primarily to children were excluded. All hospitals falling un-

der federal control, (e.g., U.S. Department of Veterans Affairs) were excluded. These hospitals are under federal mandate to reach 100% penetration of palliative care programs.[6] Hospitals that were located outside of the 50 states and the District of Columbia, and hospitals that did not respond to the AHA survey were also excluded.

Definitions of hospital types

Hospitals containing 50 or more total facility beds were the primary focus of our analyses. A 50-bed cutoff was chosen because hospitals smaller than this are unlikely to be able support a full interdisciplinary (nurse, social worker, physician) palliative care consultation team. Other subgroup analyses were completed on public hospitals, for-profit hospitals, and "sole community provider" hospitals. Public hospitals were defined as not-for-profit hospitals run by a state, county, city, joint city–county, or hospital district or authority with 50 or more total facility beds. For-profit hospitals included those institutions run by individuals, partnerships, or corporations with 50 or more total facility beds. The sole community provider designation is assigned to hospitals by Medicare and is defined as a hospital located more than 35 miles from other like hospitals or otherwise serves as the sole provider of health care services for a region secondary to limitations in local topography or prolonged severe weather conditions. Sole community provider hospitals with 1 or more total facility beds were included in these analyses.

Additional analyses were done on small hospitals (less than 50 total facility beds) and large hospitals (more than 300 total facility beds).

Analyses

Multivariable logistic regression models were used to examine the association between hospital and geographic characteristics on the presence of a palliative care program as described in our prior study.[3] Hospitals were stratified for modeling by total number of facility beds. All variables entered into the multivariable analyses appear in Table 1. Variables concerning age and wealth distribution by county were removed from the second model (Table 2) as they behaved as constants. Spearman rank correlations were used to examine the relationship between state rank of hospital palliative care penetration and state rank of the selected health care utilization measures. All analyses were performed using SAS version 9.1.3 (SAS Institute, Inc., Cary, NC). Mapping was completed using ArcGIS Desktop version 9.2. This study was exempt from Institutional Review Board (IRB) approval by the Mount Sinai School of Medicine.

Results

Prevalence of hospital palliative care

Adult hospital palliative care programs in facilities with 50 or more beds are displayed in Figure 1. States were divided into quintiles corresponding to the overall prevalence of hospital palliative care in each respective state. Nationally, state prevalence rates of hospital palliative care ranged from 10% in Mississippi to 100% in Vermont with a cumulative national average of 52.8% (1294/2452). The lowest rates of hospital palliative care were observed in Mississippi (10%), Alabama (16%), Oklahoma (19%), Nevada (23%), and

Table 1. Prevalence of Palliative Care Programs in Sole Community Provider Hospitals

State	*# Hospitals*	*#HPC (%)*
0%–20%		
Alabama	5	0 (0)
Idaho	3	0 (0)
Indiana	1	0 (0)
Louisiana	4	0 (0)
Nevada	4	0 (0)
Oklahoma	25	1 (4)
Mississippi	16	1 (6)
Texas	56	4 (7)
Illinois	8	1 (13)
Kentucky	8	1 (13)
New Mexico	16	2 (13)
Georgia	7	1 (14)
Wyoming	22	4 (18)
21%–40%		
Utah	14	3 (21)
Pennsylvania	9	2 (22)
Colorado	18	4 (22)
Connecticut	4	1 (25)
Washington	8	2 (25)
Arkansas	19	5 (26)
Kansas	31	9 (29)
North Carolina	10	3 (30)
West Virginia	13	4 (31)
Michigan	19	6 (32)
Montana	22	7 (33)
South Carolina	9	3 (33)
Hawaii	3	1 (33)
California	27	10 (37)
Nebraska	8	3 (38)
41%–60%		
Missouri	27	11 (41)
Virginia	12	5 (42)
Oregon	14	6 (43)
North Dakota	9	4 (44)
Iowa	11	5 (45)
Massachusetts	2	1 (50)
New York	14	7 (50)
Wisconsin	12	6 (50)
Minnesota	8	4 (50)
Arizona	10	5 (50)
Alaska	8	4 (50)
South Dakota	11	6 (55)
Maine	10	6 (60)
Florida	5	3 (60)
61%–80%		
Tennessee	3	2 (67)
Vermont	7	5 (71)
81%–100%		
New Hampshire	1	1 (100)
Ohio	1	1 (100)
No Sole Community Provider Programs		
Delaware		
District of Columbia		
Maryland		
New Jersey		
Rhode Island		

HPC, hospital palliative care.

Table 2. Prevalence of Palliative Care Programs in Public Hospitals with Fifty or More Beds

State	# Hospitals	#HPC (%)
0%–20%		
Alaska	1	0 (0)
Connecticut	1	0 (0)
Nevada	1	0 (0)
Oklahoma	8	0 (0)
Mississippi	17	1 (6)
Michigan	8	1 (13)
Kentucky	6	1 (17)
Alabama	20	4 (20)
21%–40%		
Louisiana	19	4 (21)
New York	8	2 (25)
Tennessee	8	2 (25)
South Carolina	11	3 (27)
Illinois	7	2 (29)
Texas	31	9 (29)
Washington	10	3 (30)
Colorado	3	1 (33)
Wyoming	6	2 (33)
41%–60%		
Georgia	19	8 (42)
Kansas	7	3 (43)
Indiana	19	9 (47)
Arizona	2	1 (50)
Arkansas	4	2 (50)
Hawaii	2	1 (50)
Minnesota	6	3 (50)
Nebraska	2	1 (50)
New Mexico	2	1 (50)
West Virginia	2	1 (50)
California	34	19 (56)
Iowa	5	3 (60)
61%–80%		
Florida	20	13 (65)
North Carolina	26	17 (65)
Idaho	3	2 (67)
Massachusetts	3	2 (67)
Ohio	12	8 (67)
Virginia	3	2 (67)
Missouri	12	9 (75)
81%–100%		
New Jersey	1	1 (100)
Oregon	2	2 (100)
Utah	1	1 (100)
No Public Hospitals		
Delaware		
District of Columbia		
Maine		
Maryland		
Montana		
New Hampshire		
North Dakota		
Pennsylvania		
Rhode Island		
South Dakota		
Vermont		
Wisconsin		

HPC, hospital palliative care.

Wyoming (25%). The highest rates were observed in Vermont (100%), Montana (88%), New Hampshire (85%), the District of Columbia (80%), and South Dakota (78%).

Separate analyses were conducted on small and large hospitals. These hospitals were subject to the same exclusion criteria as the primary study population, with the exception that they contained fewer than 50 total facility beds or more than 300 total facility beds, respectively. Hospitals defined as small constituted 37% and those defined as large constituted 16% of the nation's medical centers, respectively. The numbers of small hospitals varied widely by state: four states (Connecticut, Delaware, New Jersey, Rhode Island) and the District of Columbia did not report any hospitals in this category, whereas other states, such as Montana and South Dakota, had more than 80% of their hospitals in this category. State prevalence of hospital palliative care in small hospitals ranged from 0% in Louisiana, Maryland, Nevada, and New Mexico to 78% in Vermont with a national average of 20.1%.

Large hospitals constituted 2%–46% of all hospitals in states across the country with the exception of Wyoming (which had zero large hospitals). State prevalence rates of hospital palliative care in large hospitals ranged from 0% in Nevada to 100% in 20 states with a cumulative national average of 75.5%. Maps showing state ranks by prevalence of hospital palliative care in large hospitals are displayed in Figure 2.

Nationally 40.9% (144/352) of public hospitals and 20.3% (84/413) of for-profit hospitals reported hospital palliative care. Among hospitals designated by Medicare as sole community providers, 160 of 554 hospitals (28.8%) reported palliative care services. State-by-state results for these subgroups can be found in Tables 3–5.

Hospital, geographic, and regional characteristics

Institution and community characteristics associated with the presence of hospital palliative care, stratified by bed size, are in Tables 1 and 2. Among institutions containing between 50 and 300 total facility beds (Table 1), hospitals located in the West and Midwest were significantly more likely to report hospital palliative care after controlling for other variables (reference Northeast, odds ratio [OR] = 0.1.58; 95% confidence interval [CI], 1.1–2.27; $p = 0.01$ and OR = 2.16; CI, 1.56 to 3.01; $p < 0.0001$, respectively). For-profit hospitals were significantly less likely to report hospital palliative care compared to not-for-profit institutions (OR = 0.21; CI, 0.15–0.29; $p < 0.001$). Variables found to be associated with the presence of hospital palliative care were: institutions that owned a hospice program (OR = 1.82; CI, 1.44–2.3; $p < 0.0001$), status as an American College of Surgery (ACS)-approved cancer hospital (OR = 1.66; CI, 1.33–2.07; $p < 0.0001$), and the percent of persons in the county with a college education (reference below 70%; for 70%–90%, OR = 1.78; CI, 1.32–2.39; $p = 0.0001$; for 90% and up, OR = 2.43; CI, 1.58–3.75; $p < 0.0001$).

Among institutions containing more than 300 total facility beds (Table 2), for-profit and public hospitals were significantly less likely to report hospital palliative care when compared to not-for-profit hospitals (OR = 0.23; CI, 0.12–0.44; $p < 0.0001$ and OR = 0.25; CI, 0.14–0.43; $p < .0001$, respectively). Institutions that owned a hospice program (OR = 1.91; CI, 1.22–2.99; $p = 0.005$) and that were affiliated

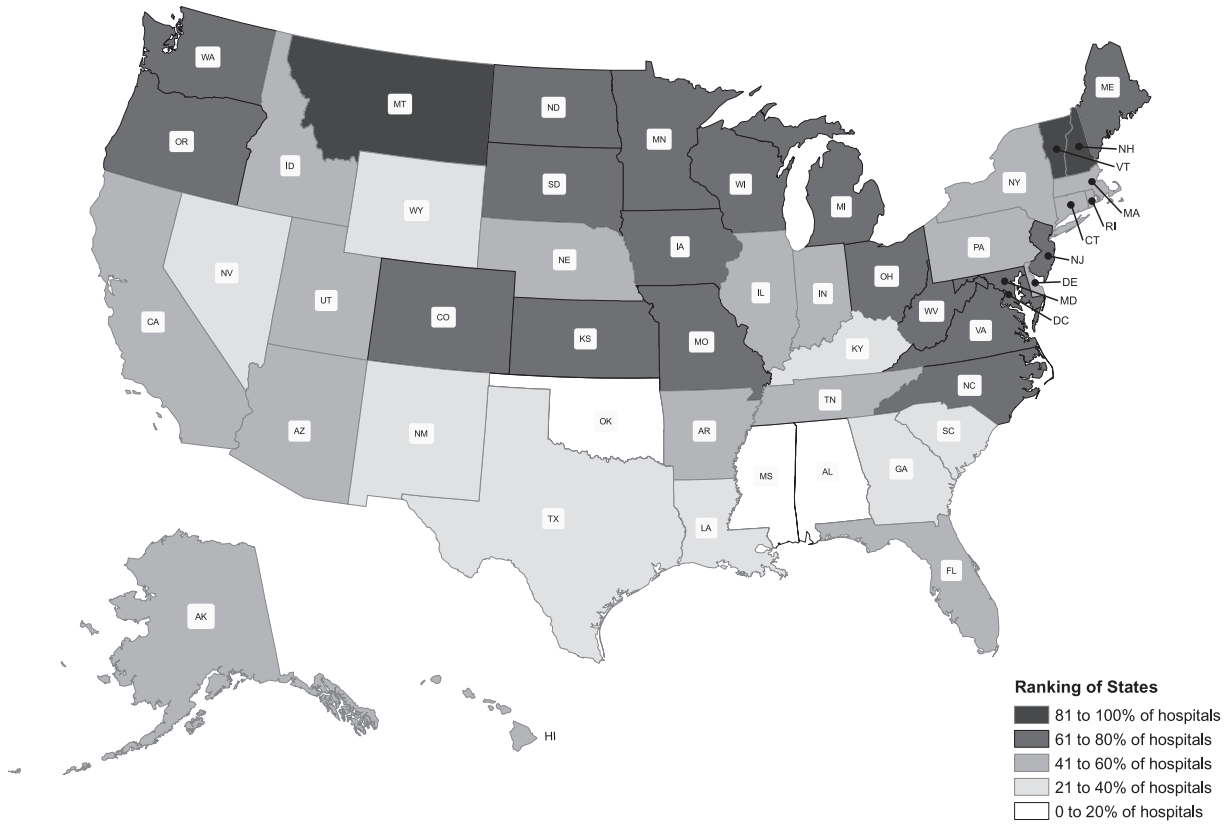

FIG. 1. Hospital palliative care programs: study hospitals (50 or more beds).

with a medical school (OR = 2.18; CI, 1.24–3.83; $p = 0.01$) were significantly more likely to report hospital palliative care.

Palliative care programs in teaching hospitals

Of the 121 allopathic medical schools in the United States, 116 were affiliated with hospitals that responded to the AHA survey. Of these 116 schools, 98 were affiliated with at least one hospital reporting hospital palliative care (national average, 84.5%). Thirty-eight of 43 (88.4%) private medical schools were affiliated with at least one hospital reporting hospital palliative care. The 5 private medical schools affiliated with hospitals not reporting hospital palliative care were: Albany Medical College, Boston University School of Medicine, Meharry Medical College, Tufts University School of Medicine, and Yale University School of Medicine.

Sixty of 73 (82.2%) state-funded medical schools were affiliated with hospitals reporting hospital palliative care. The 13 schools not affiliated with a hospital palliative care were found in 12 states. While most of these states contained more than one state-funded medical school, 4 (33%) did not contain a medical school affiliated with a hospital palliative care program: Connecticut, Mississippi, Nebraska, and Nevada.

Palliative care and health care utilization

There were significant correlations between state rankings of hospital palliative care penetration and state rankings of five of the six selected measures of health care utilization. Greater state penetration of hospital palliative care was significantly correlated with lower Medicare hospital death rates ($R^2 = 0.028$, $p = 0.048$), fewer ICU/CCU admissions during terminal hospitalizations ($R^2 = 0.31$, $p = 0.03$), fewer ICU/CCU admissions per 1000 decedents in the last 6 months of life ($R^2 = 0.32$, $p = 0.02$), fewer ICU/CCU days per decedent in the last 6 months of life ($R^2 = 0.31$, $p = 0.02$) and lower overall Medicare reimbursement/enrollee ($R^2 = 0.33$, $p = 0.02$). State ranking of the number of hospital admissions in the last 6 months of life was not significantly correlated with state ranking of hospital palliative care penetration ($R^2 = -0.25$, $p = 0.08$).

Discussion

In this study we have presented the most recent estimates to date of the prevalence of hospital palliative care programs in the United States. We found wide geographic variation in access to palliative care services although factors predicting hospital palliative care have not changed markedly since our last report in 2005.[3] Overall, we observed elevated rates of hospital palliative care in large hospitals (more than 300 beds, 75.5%) and decreased rates in small hospitals (fewer than 50 beds, 20.1%) with a national prevalence of hospital palliative care in study hospitals at 52.8%. A minority of public hospitals (40.9%), for-profit hospitals (20.3%) and sole community provider hospitals (28.8%) reported hospital palliative care. We observed that a majority of medical school-affiliated hospitals (84.5%) reported hospital palliative care.

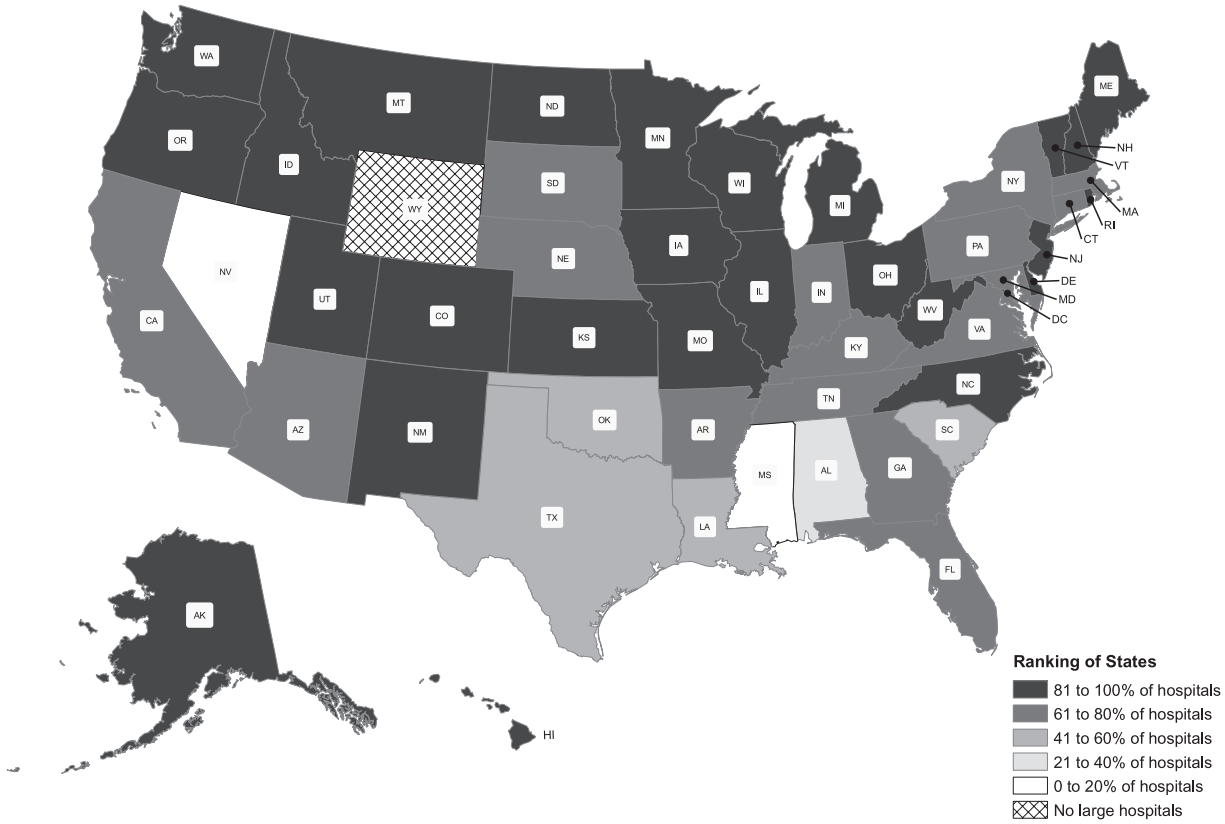

FIG. 2. Hospital palliative care programs: study hospitals (more than 300 beds).

Relationship to prior studies

There has been a steady increase in the number of U.S. hospitals reporting a palliative care program since we first examined prevalence rates of hospital palliative care in 2001[2] such that in 2006, 52.8% (1294/2452) of American hospitals reported a program. Using the inclusion and exclusion criteria used in this study, the yearly rates of hospital palliative care programs in the United States were: 24.5% (658/2686) in 2000, 30.4% (805/2649) in 2001, 35.6% (946/2658) in 2002, 40.4% (1083/2684) in 2003, 44.8% (1151/2570) in 2004, and 44.8% (1151/2570) in 2005.

Since our last report in 2005,[3] which reflected data from 2003, the overall prevalence of hospital palliative care programs has increased 8.6% in the Northeast, 16.4% in the Midwest, 17.2% in the West, and 9.6% in the South. This growth has occurred largely in not-for-profit hospitals. In our examination of hospital subgroups, prevalence rates from 2003 to 2006 increased by 10% in public hospitals (30.9% to 40.9%) and 4.2% in for-profit hospitals (16.1% to 20.3%), while decreasing by 2.3% in sole community provider hospitals (31.1% to 28.8%).

Public access

This study revealed important differences in access to hospital palliative care across this country. In the states of Vermont, Montana, and New Hampshire, seriously ill patients have access to palliative care services in nearly every hospital, whereas access to these services in Mississippi, Alabama, and Oklahoma is severely limited. In addition to notable disparities in geographic availability, we further observed strikingly low rates of hospital palliative care in public and sole community provider hospitals.

Public and sole community provider hospitals often serve as the only option for medical care for uninsured patients and geographically isolated communities, respectively. Thus, our finding that the majority of these institutions lack palliative care services speaks to a disparity in access to comprehensive care for some of the sickest and most vulnerable patient populations. Indeed, based on our results, only 41% of public hospitals and less than 30% of sole community provider hospitals provide their patients with access to hospital palliative care. These data suggest that targeted efforts to enhance the development of palliative care programs in these environments are critically needed. The increasing data suggesting that palliative care programs not only improve quality of medical care for patients with serious illness,[7–10] but do so with lower associated hospital costs than usual care[11–13] provides dual incentives for states, cities, and the federal government to promote the development of hospital palliative care programs in these settings while reducing hospital and patient cost during hospitalization. State legislatures can play an important role in this process by providing funding to hospitals to attend educational and technical assistance programs focused on promoting the development of palliative care programs especially public and sole community provider hospitals. Additionally, state governments can further promote the development of palliative care through legislation that promotes palliative care education and training as exemplified by the Palliative Care Education

Table 3. Prevalence of Palliative Care Programs in For-Profit Hospitals with Fifty or More Beds

State	*# Hospitals*	*#HPC (%)*
0%–20%		
Alabama	13	0 (0)
Arizona	6	0 (0)
Georgia	15	0 (0)
Idaho	1	0 (0)
Illinois	2	0 (0)
Mississippi	17	0 (0)
Nebraska	1	0 (0)
Nevada	6	0 (0)
New Mexico	5	0 (0)
Oregon	2	0 (0)
Pennsylvania	9	0 (0)
Wyoming	1	0 (0)
Kentucky	8	1 (13)
South Carolina	16	2 (13)
Texas	85	12 (14)
Oklahoma	14	2 (14)
Utah	7	1 (14)
California	40	6 (15)
Louisiana	13	2 (15)
Massachusetts	5	1 (20)
21%–40%		
Arkansas	14	3 (21)
Tennessee	17	4 (24)
Florida	45	13 (29)
Missouri	12	4 (33)
41%–60%		
Ohio	3	3 (43)
Kansas	7	1 (50)
New Hampshire	2	1 (50)
North Carolina	6	3 (50)
Virginia	10	5 (50)
West Virginia	6	3 (50)
Wisconsin	2	1 (50)
Indiana	11	6 (55)
61%–80%		
Washington	3	2 (67)
81%–100%		
Colorado	6	5 (83)
Alaska	1	1 (100)
Maryland	1	1 (100)
South Dakota	1	1 (100)
No For-Profit Hospitals		
Connecticut		
Delaware		
District of Columbia		
Hawaii		
Iowa		
Maine		
Michigan		
Minnesota		
Montana		
New Jersey		
New York		
North Dakota		
Rhode Island		
Vermont		

HPC, hospital palliative care.

and Training Act recently passed in New York.[14,15] The New York legislation will support palliative care training programs for health care professionals, identify and fund Centers for Palliative Care Excellence, and create a New York State Palliative Care Education and Training Council to guide state policies on palliative care.

Medical training

While we found overall high rates of hospital palliative care in medical school teaching hospitals, complete penetration has not yet occurred in these institutions. Given that medical training is rooted in physician mentoring and role-modeling, it is of critical importance that future physicians receive not only didactic training in palliative medicine but exposure to clinical practice and programs in their third and fourth years of undergraduate medical education. Although this study was unable to qualify or quantify the extent of exposure or formal education in palliative care in institutions reporting hospital palliative care, at the most basic level, palliative care services must be present within an institution before the opportunity for such education exists.

Health care utilization

States that ranked high in hospital palliative care penetration tended to rank low on a range of health care utilization measures including number of hospital deaths, number of admissions during the terminal hospitalization, number of ICU/CCU admissions during the last 6 months of life, and total Medicare reimbursements. There are several reasons that may explain these finding. The underlying factors that result in lower health care utilization may also contribute to the development of palliative care programs. Second, underlying patient-related factors or community factors that promote the development of palliative care programs may also be associated with lower health care utilization. Finally, it is possible that the presence of hospital palliative care programs result in lower health care utilization and in improved quality for Medicare beneficiaries in the last 6 months of life. Future studies will need to address causal links between these findings.

Limitations

There are several limitations to this study that should be noted. First, the identification of hospital palliative care programs was based upon hospitals' self-report to the American Hospital Association (AHA) Annual Survey™ and it is possible that hospitals' answers to the survey were inaccurate. As a result of anecdotal reports of inaccuracies in our last report, we conducted an additional survey providing hospitals with the opportunity to correct the AHA survey and in particular, ensure that their hospital palliative care program was included in our results. Twenty percent of hospitals elected to respond to this survey. Of the nearly 900 hospitals that responded, over 80% agreed with the AHA's survey suggesting that the numbers that we report have strong validity.

Second, we have no information about the structure and quality of the programs that we identified. Specifically, using the data sources available to us, it was impossible to determine the administrative structure, size, and processes of care employed by these hospital palliative care programs and whether they were in compliance with the recently devel-

Table 4. Hospital and Community Characteristics Associated with Hospital Palliative Care Programs for Institutions with Fifty to Three Hundred Beds

	Odds ratio	*95% CI*	p *value*
Region (Reference: Northeast)			
Midwest	2.16	1.56, 3.01	<0.0001
South	1.19	0.85, 1.66	0.31
West	1.58	1.1, 2.27	0.01
Hospital ownership (reference is nonprofit)			
For-profit hospital	0.21	0.15, 0.29	<0.0001
Public hospital	0.58	0.43, 0.78	0.0004
Sole community providers	1.10	0.78, 1.54	0.60
Hospital owns hospice program	1.82	1.44, 2.3	<0.0001
American College of Surgery (ACS)-approved Cancer Program	1.66	1.33, 2.07	<0.0001
Percent > bachelor's degree in the county (reference: below 70%)			
90% and up	2.43	1.58, 3.75	<0.0001
70%–90%	1.78	1.32, 2.39	0.0001
Percentage of white in the county (Reference: below 40%)			
60% and up	1.09	0.78, 1.52	0.61
40%–60%	1.14	0.77, 1.7	0.52
Percentage age 65 and over in the county (reference: below 10%)			
15% and up	1.47	0.94, 2.31	0.09
10%–15%	1.17	0.85, 1.62	0.33
Percent below poverty level in the county (reference: below 10%)			
10% and up	1.09	0.84, 1.4	0.52
Medical school affiliation	1.04	0.39, 2.79	0.94

CI, confidence interval.

oped National Quality Forum Framework for palliative care. Third, for the purposes of this study we limited our primary study population to hospitals containing 50 or more facility beds based upon the rationale that it is unlikely that smaller hospitals would have a patient population large enough to support a full interdisciplinary palliative care team as recommended by the National Consensus Project.[16]

As a result of the limitations inherent in the AHA survey we were unable to report on the prevalence of pediatric palliative care programs. The AHA reports the presence of hospital palliative care programs through a single variable and does not provide additional information whether a pediatric palliative care program is also available at an institution. Separate analyses of children's hospitals are possible and should be addressed in the future.

Last, while we have chosen to exclude federal hospitals from all analyses because of their mandate to reach 100% penetration of palliative care programs,[6] we acknowledge the importance of the VA hospitals as clinical teaching sites for medical students across the country. However, VA hospitals typically do not serve as the primary clinical teaching site for any medical school in the United States and as such,

Table 5. Hospital and Community Characteristics Associated with Hospital Palliative Care Programs for Institutions with More than Three Hundred Beds

	Odds ratio	*95% CI*	p *value*
Region (reference: Northeast)			
Midwest	1.67	0.84, 3.34	0.15
South	0.87	0.49, 1.54	0.63
West	1.69	0.83, 3.43	0.15
Hospital ownership (reference is nonprofit)			
For-profit hospital	0.23	0.12, 0.44	<0.0001
Public hospital	0.25	0.14, 0.43	<0.0001
Sole community providers	1.20	0.22, 6.4	0.84
Hospital owns hospice program	1.91	1.22, 2.99	0.0045
American College of Surgery (ACS)-approved Cancer Program	1.02	0.63, 1.67	0.92
Percent > bachelor's degree in the county (reference: below 70%)			
90% and up	2.27	0.94, 5.52	0.07
70%–90%	1.96	0.94, 4.08	0.07
Percentage of white in the county (reference: below 40%)			
60% and up	1.09	0.63, 1.88	0.75
40%–60%	1.02	0.56, 1.85	0.95
Medical school affiliation	2.18	1.24, 3.83	0.0066

CI, confidence interval.

the presence of a palliative care program in a VA does not ensure that all medical school students have access to a clinical palliative care program.

Despite these limitations, the data presented in this study represent the most recent estimates of access to hospital palliative care by patients and medical students reported in the literature to date.

Conclusion

We have identified significant disparities in public and educational access to hospital palliative care services. The ultimate goal of palliative care is improving the overall quality of care for patients with serious illness and their families. In order to do so, however, patients must be able to access these services in their local hospital and medical trainees must receive training in, and exposure to, hospital palliative care. Future research needs to focus on efforts to promote the development of hospital palliative care programs in under-represented hospitals (public, sole community provider, for-profit), identifying barriers to the development of these programs, and on identifying the structures of existing programs and the care processes that they employ. Finally, the association between the prevalence of hospital palliative care programs and lower Medicare spending for the seriously ill is an intriguing finding that needs to be further studied.

Addendum

Since this research was completed, Yale-New Haven Hospital has initiated a palliative care program.

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